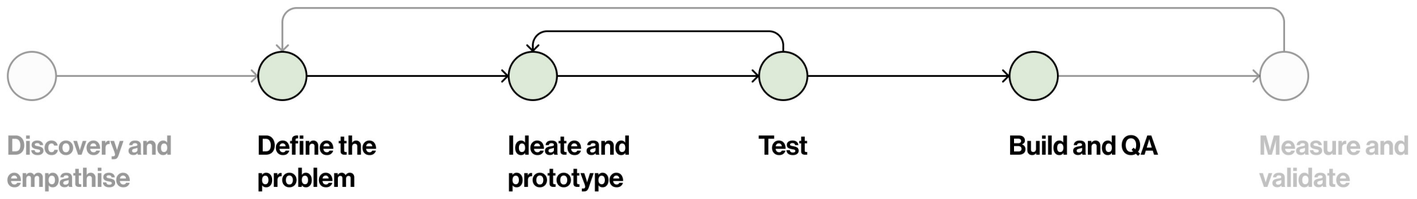
Product Design Experience 1 - Healthcare Product

September 2022 - October 2023

Skills applied ✳

Market research | User research | Lo-fi and hi-fi prototyping | AI Design | Design systems | HTML, CSS & JavaScript

I led the following parts of the design process for this product, which are detailed in this document

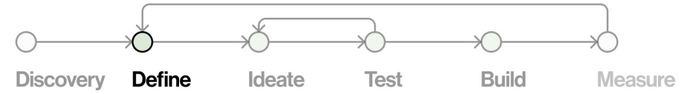


Disclaimer

To comply with confidentiality agreements and protect client and company privacy, all product-specific details, client information and proprietary data have been omitted or anonymised. This portfolio highlights my design process, skills and contributions through generalised examples and high-level summaries. Thank you for understanding the need for discretion while reviewing my work.

Contents

Problem space



The current clinician triage process within the NHS is inaccurate, slow and unsafe.

Referrals processing overview currently ✳ Market research

- On average, **10 referrals** come through per day.
- Each referral can take **6-12 minutes** to process, leading to **1-2 hours** out of a clinicians day where they are processing referrals rather than addressing patient needs.

Problem space research - Interviews with clinicians ✳ User research

- **“Current software is clunky, slow and unattractive”** → The current system is an **unpleasant experience.**
- **“Rarely is the consultant given enough information for a decision”** → Consultants are **not provided with sufficient information.**
- **“I don’t want to spend 5 hours of consultant time on triage”** → The current process is **time consuming.**
- **“Some patients require blood tests before appointments - time is wasted around that”** → The current system leads to **incorrect patient management.**
- **“Attachments open in a different window - split screens are needed”** → Referrals are often in **inconsistent** or poor formats.

5Ws 1H

Who

NHS clinicians that regularly process GP referrals.

What

A GP referral process system that shortens the time taken and improves the accuracy of referral recommendation.

Why

Generating recommendations for GP referrals was identified as a process that takes a lot of time for the clinicians and can be inaccurate - there is room for automation and improvement.

When

2023 - present

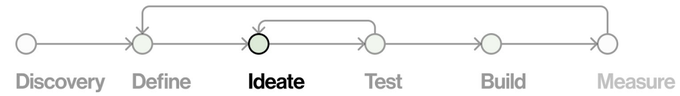
Where

Initial testing to be conducted in Southampton General Hospital but the solution should be scalable to work across all UK practices.

How

Using the company’s expertise in healthcare solutions, technology transformations and software automation.

Lo-fi prototyping



Having defined the problem, a lo-fi prototype was built to start concept development.

Initial lo-fi prototype - Fully automated process (Class II Medical Device) ✳ Lo-fi prototyping

Functionality:

- Referrals were processed entirely **automatically** using an LLM (large language model).
- **No human input** required - recommendations were generated by analysing the GP notes and selecting an outcome from a database and the NICE guidelines.

Key assumption tested:

- Clinicians would **trust** fully automated recommendations in clinical workflows.

Focus group findings:

- Insight: clinicians felt **uncomfortable with fully automated medical recommendations** for the following reasons:
  - **Lack of visibility** into the decision-making process.
  - **Risk** to the quality of advice and their professional reputation.

Iteration - Shift to semi-automated process (Class I medical Device)

Updated prototype features:

- Users gained **access to information** and data being processed by the LLM.
- **Agency:** clinicians could approve or veto recommendations.
- These changes **balanced automation with user control** for improved **trust** and **accountability**, priorities in healthcare.

Design approach

- Predominantly built using the company's design system to ensure consistency and fast iteration generation.
- Custom components were created for features not covered by the design system, tailoring the design to meet the specific user needs.

Lo-fi prototyping impact

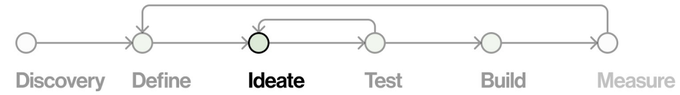
- Quickly identified critical user priorities before investing in high-fidelity designs.
- Iterative feedback loop ensures alignment with user expectations and regulatory requirements.

Designing for AI ✳ AI Design

Accounting for how users react to AI generated recommendation gave me experience in developing AI user interfaces - I have hands on experience in developing user interfaces that take into account comfort levels with autonomy and algorithmically produced outcomes in a very information sensitive field (healthcare).

See next page for screenshots →

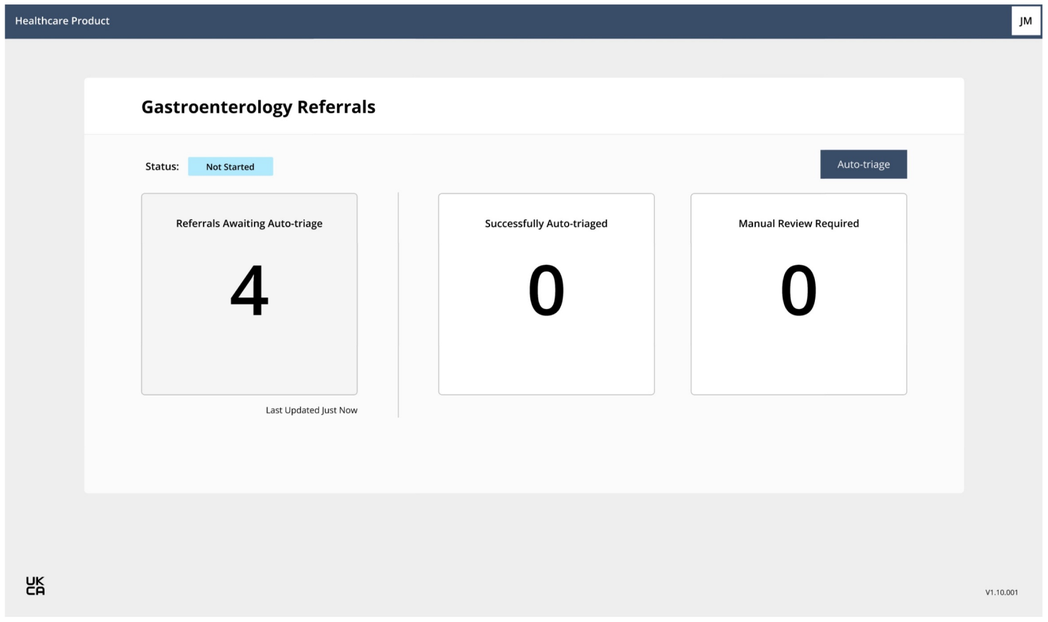
Lo-fi prototyping



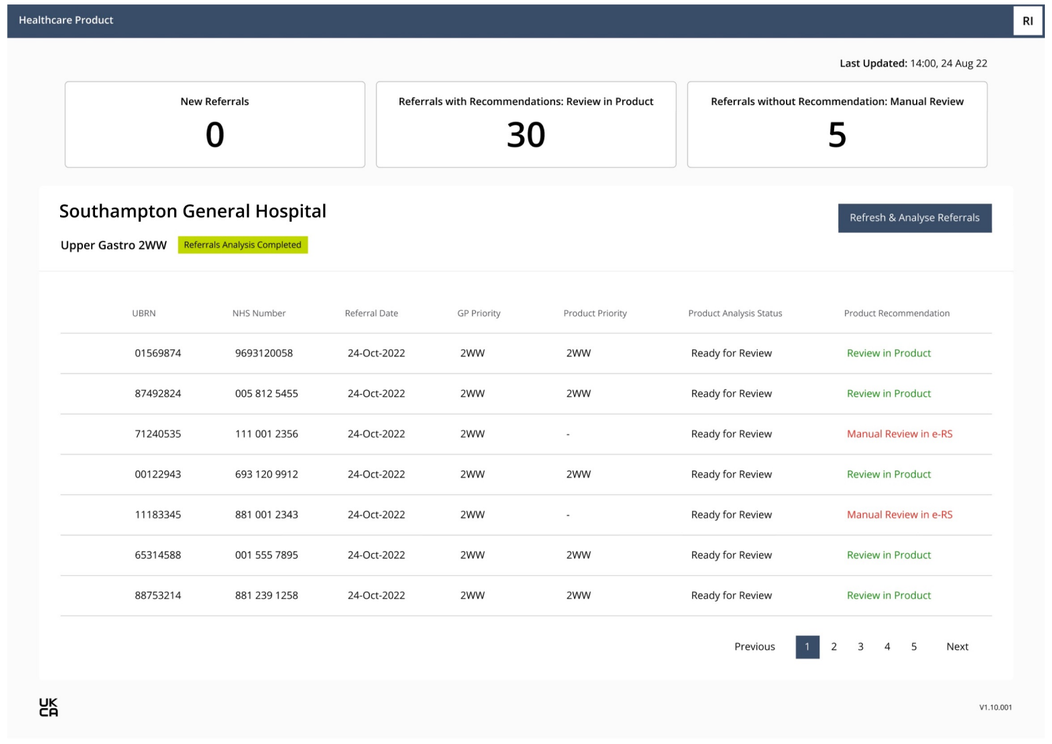
Having defined the problem, a lo-fi prototype was built to start concept development.

The below images show iteration 1 of the product (Class II medical device) and the progression to iteration 2 of the product (Class I medical device). Due to nondisclosure agreements, client and company details/branding have been removed or simplified.

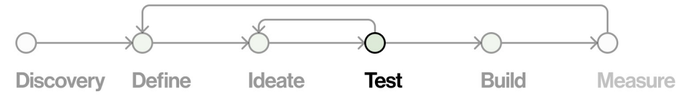
Iteration 1 - Class II Medical Device



Iteration 2 - Class I Medical Device



User testing



A round of user interview testing validated the value of the product prototype.

Overview of the user testing sessions ✳ User research

- **Participants:** 5 clinicians
- **Tasks:** 2 referral processing tasks
- **Duration:** 60 minute sessions
- **Objective:** Assess the value of the Class I product and determine user problems

Participant profiles

- **Age range:** 39-54 years
- **Specialties:** mix of gastroenterologist and urologist consultants
- **Experience:** 3-20 years in their respective fields

Session structure

1. Pre-testing questions:

Explored clinicians' current triage experience and workflows to establish context and gain some understanding of user problems and values.

→ **2. Task execution:**

Participants used the product interface to process two referrals - one with a recommendation from the product, one without.

→ **3. Post-testing questions:**

Gathered feedback on:

- Product performance compared to their current process.
- Perceived value of the product.

Key findings

Pre-testing questions - Pain points in current referral process:

Unpleasant user experience
4/5 mentioned

Time consuming
4/5 mentioned

Incorrect patient management
3/5 mentioned

Insufficient information
3/5 mentioned

Inefficient use of consultants
2/5 mentioned

Poor referral format
2/5 mentioned

Post-testing questions - Improvement areas for the interface:

- **Clearer** and more **comprehensive** patient information display.

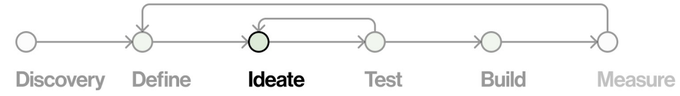
Referral processing success metrics:

- Determined **metrics** used to decide if a referral has been successfully processed:
  - **Speed**
  - **Accuracy**
  - **Safety**

Value perception:

- Clinicians mentioned that the product was **more pleasant** to use than the current process, and would increase the **speed** and **safety** of the referral process.

Hi-fi prototyping



After analysing the insights from the user testing, I developed a hi fi prototype to bridge design and development.

3 components of the hi-fi prototype ✳ Hi-fi prototyping

→

User flow:

- A detailed, end-to-end journey illustrating how users interact with the product in a ‘start to finish’ format.
- Main focus was to **document all features** and on-screen user interface detail.

Figma prototype demo:

- Showcased **product interactions** with a dynamic figma prototype, emphasising usability and accessibility.
- Main focus was to document and demonstrate **interactive elements** such as hover states, tables and dropdowns. Was also used as **marketing material** to **demonstrate the value** of the product before development.

Design system:

- Integrated design components from the company design system with custom elements tailored to new features.
- Ensured **consistency, scalability and alignment** with brand guidelines.

Functions of the hi-fi prototype

Feature testing:

- Provided a complete interface to evaluate newly developed features and understand how they interacted with each other.
- Validated usability, visual alignment and user experience improvements.

Implementing micro-interactions:

- Added animations, hover states and transitions to make the interface intuitive.
- Ensured accessibility compliance for diverse user needs.

Edge case handling:

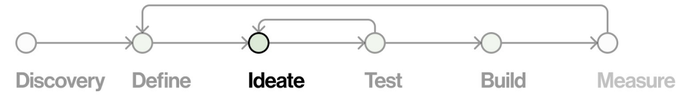
- Simulated and tested error messages, login/logout flows and other uncommon scenarios.
- Anticipated real-world usage challenges to enhance robustness.

Efficient developer handoff:

- Delivered a clear, intuitive prototype to communicate design intent.
- Enabled developers to grasp both visual specifications and functional nuances quickly.

See next page for screenshots →

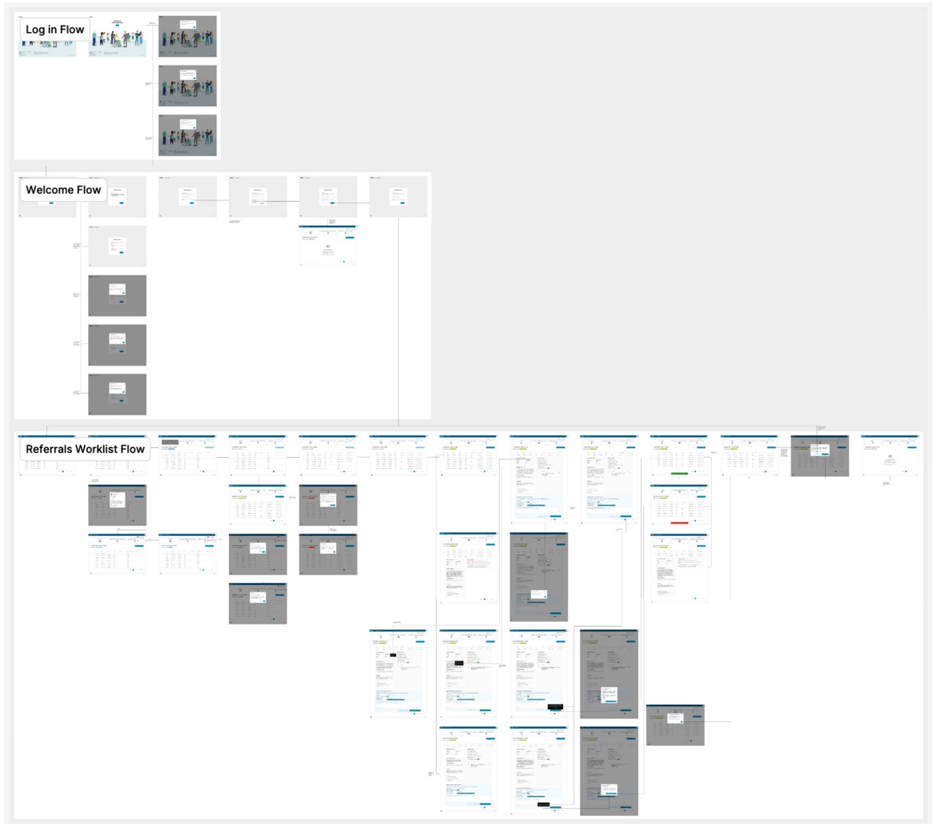
Hi-fi prototyping



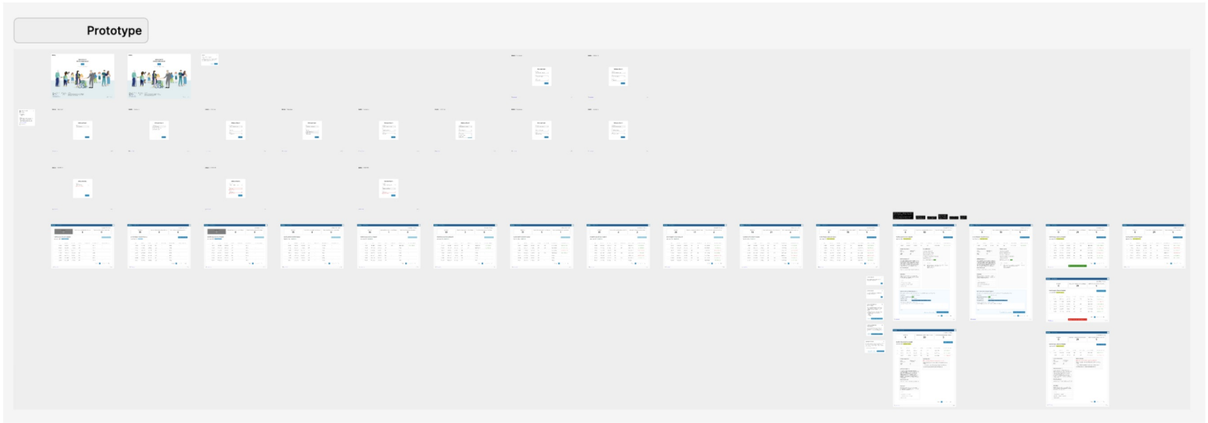
After analysing the insights from the user testing, I developed a hi fi prototype to bridge design and development.

Below are the overviews of the documents that went into the high fidelity prototype. Due to non-disclosure agreements, an overview has been provided and details are not viewable - the below images demonstrate the structure of the hi-fi prototype rather than the content.

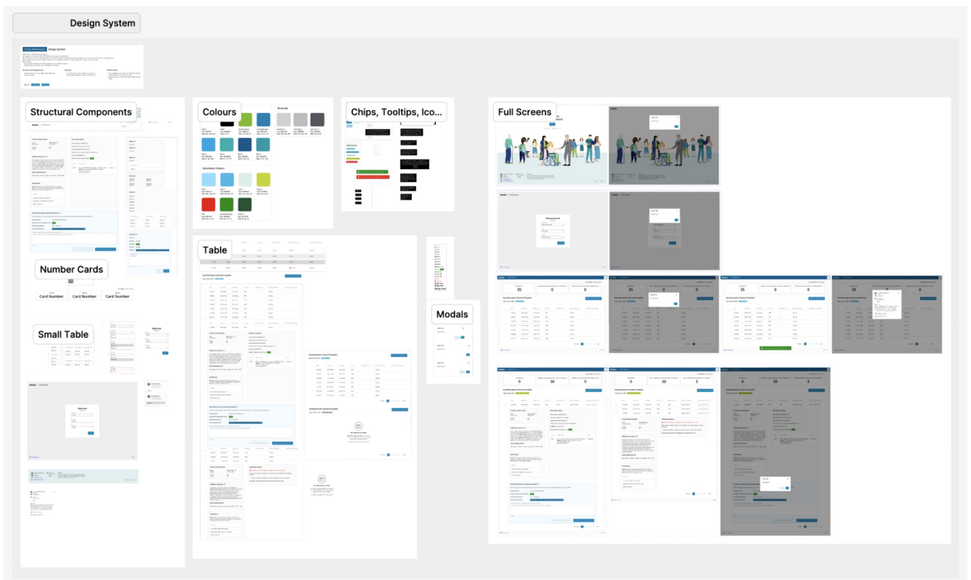
User flow



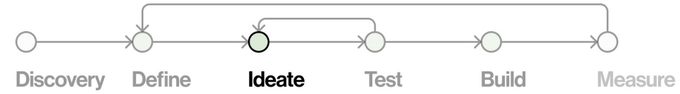
Demo



Design System



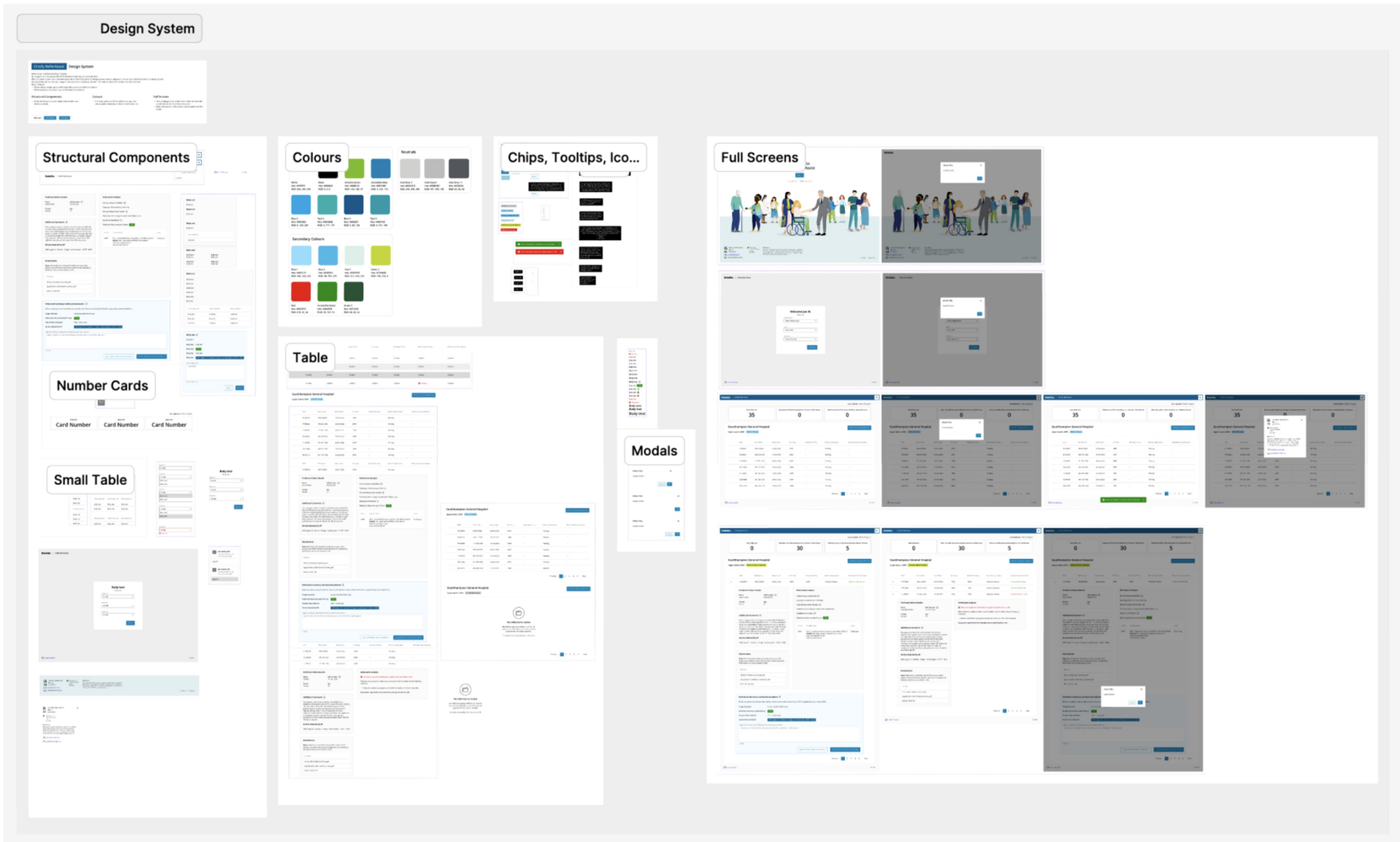
Hi-fi prototyping



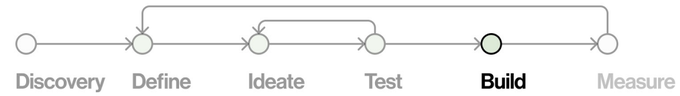
A more detailed view of the design system, showing how every component was connected.

Design system ✳ Design Systems

- All components that made up the product interface could be found here.
- Company design system components were used where possible and were included in the product design system - any adaptations were minor and included in the product design system.
- Any structural or textual changes to the product could be made here, and the user flow and prototype would be updated accordingly, saving hours of updating manual work.
- Due to non-disclosure agreements, details are not viewable - the below image demonstrates the structure of the design system rather than the content.



Build



Once the hi-fi prototype had been approved by stakeholders (PMs, directors), the designs were handed over to the developers.

My roles as a designer in the build phase ✳ HTML, CSS & JavaScript

🎟

Creating and organising front-end tickets:

- Having created the hi-fi prototype, I was in the best position to translate the Figma designs into **organised actionable** front-end tickets.
- I aimed to make each ticket **detailed, clear and developer friendly** so that discussions were focused on the product development, rather than the content of the tickets.
- My previous experience in **HTML, CSS and JavaScript** helped when making the tickets clear and actionable.
- I broke tickets into specific **categories** such as: feature development, interaction details and edge cases.

🔎

Design QA:

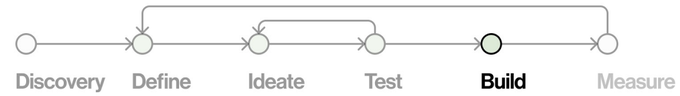
- As the tickets were completed, I reviewed the development progress to ensure **alignment** with the Figma designs.
- This involved checking the completed development work against both the Figma and the details on the front end ticket.
- Throughout this process, I would also document minor inconsistencies that I found between the designs and the developed product. This allowed the design QA conversations to stay feature specific, but allowed any lower priority defects to be captured and fixed at a later date.

✓

Approving final designs:

- Once design QA had been completed and the product met the **design intent and quality standards**, I gave the green light for release by approving the pull request.

Summative Evaluation



Ensuring safety and mitigating medical risks.

What is summative evaluation?

- Summative evaluation is a **safety and risk mitigation** testing process that all medical devices (software and hardware) have to pass. The evaluation ensures the product is **safe** to use in all plausible scenarios and **addresses medical risks** identified by third party experts.
- This is tested by creating scenarios to test the product with participants in a **medical context**, pinpointing any sections of the interface that could pose medical risks.

Activities that I led

Documentation:

- Created and contributed to essential documents for running the evaluation:
  - **Summative protocol** - detailed procedures for the tests.
  - **Session scripts** - clear and unbiased guidance for sessions.
  - **Data collection sheets** - structured spreadsheets for accurate recording.
  - **Final evaluation report** - comprehensive summary of findings and recommendations.

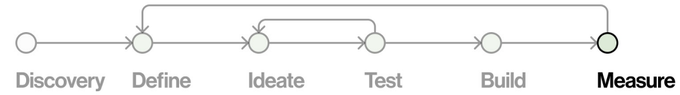
User session execution:

- Conducted 15 evaluation sessions with **senior medical clinicians**, each lasting 2 hours
- Ensured the highest standard of user testing by:
  - Avoiding leading questions to gather unbiased results.
  - Building a rapport with participants to create a comfortable testing environment.
  - Identifying high-risk errors caused by participants.

Risk analysis:

- Assessed test results and data to ensure that the product interface mitigates any serious medical risks.
- Delivered actionable insights for improving product safety and usability.

Outcome



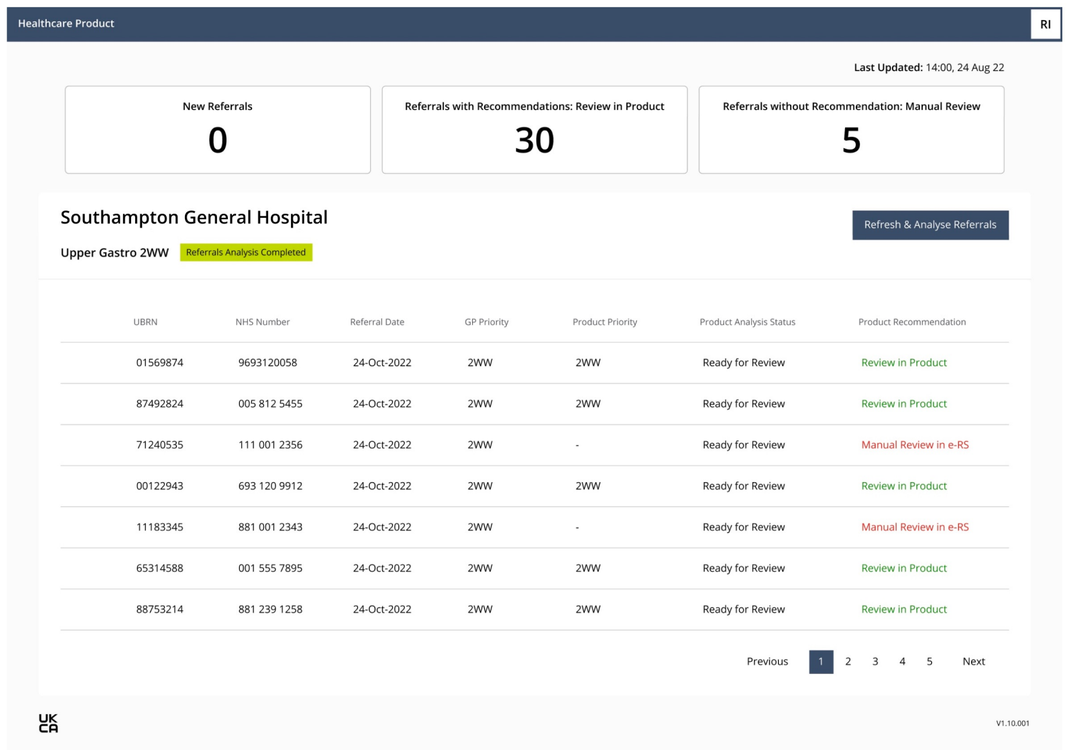
The product was UKCA approved and registered as a SaMD (software as a medical device) for use in practices across the UK.

Outcome

With product development and safety testing completed, the product became a part of a suite under the healthcare branch of the business.

Referrals page:

The screenshot below shows the product once the referrals have been processed by the LLM. The list shows the referrals that the clinicians have to review, split into one of two categories highlighted in red or green - a recommendation has been produced and is safe to pass onwards, or a safety measure has meant that the clinician has to review the referral manually (for example if the patient is pregnant).



Expanded referral:

The below screenshot shows an expanded referral that is ready to review, where the information from the GP is displayed on the left (including patient GP notes and patient details), and the LLM analysis results of that information (including a summary and action recommendation) are displayed on the right. All data is fake.